

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A top sealing plate used for a battery, comprising:

a filter, a cap, and a valve body,

wherein said filter includes a valve hole and upper opening;

said cap has a convex portion, and a flange portion disposed around said convex portion;

an opening end of said upper opening of said filter has a bend portion;

an outer periphery end of said flange portion of said cap and said bend portion include a caulked portion that is caulked and jointed to each other;

said caulked portion is formed by caulking while said outer periphery end of said flange is positioned in said bend portion;

said valve body is disposed to cover said valve hole, in a space formed between said cap and said filter;

said caulked portion includes a first ~~both contact states of (i) a strong contact~~ portion and ~~(ii) a weak~~ a second contact portion; between the surface of the outer periphery end of said flange and said bend portion, a contact pressure of said first contact portion is stronger than a contact pressure of said second contact portion; and

said outer periphery end of said flange portion includes a projection extending from at least one out of the surface and the back thereof;

said first contact portion is formed from a contact of said projection and said bend portion; and

said cap and said filter are electrically connected to each other by the contact with said outer periphery end and said bend portion at said caulked portion.

2. (Currently Amended) The top sealing plate of claim 1,

wherein each of said strong first contact portion is one of a plurality of first contact portions, and said weak second contact portion is one of a plurality of second contact portions, and said caulked portion includes a plurality of strong said first contact portions and a plurality of weak said second contact portions; and

said plurality of strong first contact portions and said plurality of weak second contact portions are disposed along the circumferential or radial direction of said cap.

3. (Currently Amended) The top sealing plate of claim 1,

wherein said battery comprises a battery case, and a positive electrode, negative electrode, electrolyte, gasket, and said top sealing plate disposed in said battery case;

wherein said top sealing plate is disposed at the opening of said battery case so as to close said battery case, in a state of being electrically insulated by said gasket; and

said filter is electrically connected to said positive electrode.

4. (Currently Amended) The top sealing plate of claim 3,

wherein said battery is cylindrical in shape;

said battery case has a circular opening;

said top sealing plate is disposed at said opening of said battery case so as to close said battery case;

said cap has a gas vent hole; and

said filter secures said valve body and said cap in ~~predetermined~~predetermined positions.

5. (Currently Amended) The top sealing plate of claim 1,

~~wherein said outer periphery end of said flange portion includes a projection extending from at least one out of the surface and the back thereof; and~~

wherein said projection includes at least one selected from the group consisting of a plurality of small projections, bulges, and peripheral edge projected from the surface of said flange.

6.-8. (Cancelled).

9. (Currently Amended) The top sealing plate of ~~claim 6~~claim 1,

wherein said projection is disposed on the surface of said outer periphery end of said flange positioned at the same side as said convex portion.

10. (Currently Amended) The top sealing plate of ~~claim 6~~claim 1,

wherein said projection has vertically spring against the contact surface between said flange portion and said bend portion.

11. (Cancelled).

12. (Previously Presented) A top sealing plate used for a battery, comprising:

a filter, a cap, and a valve body,

wherein said filter includes a valve hole and upper opening;

said cap has a convex portion, and a flange portion disposed around said convex portion;

an opening end of said upper opening of said filter has a bend portion;

an outer periphery end of said flange portion of said cap and said bend portion include a caulked portion that is caulked and jointed to each other;

said caulked portion is formed by caulking while said outer periphery end is positioned in said bend portion;

said valve body is disposed to cover said valve hole, in a space formed between said cap and said filter;

a surface of said outer periphery end of said flange has a projection;

said outer periphery end including said projection and said bend portion are caulked;

said cap and said filter are electrically connected to each other, by contact between said outer periphery end at said caulked portion and said bend portion;

the distance from a mating face of said filter and cap to the peak of said projection is greater than the thickness of said flange portion; and

each of the peaks has a stronger contact pressure against said bend portion of said filter as compared with zones other than said peaks.

13. (Original) The top sealing plate of claim 12,

wherein said projection includes at least one selected from the group consisting of a plurality of small productions, bulges, and projected peripheral edge.

14. (Previously Presented) A top sealing plate used for a battery, comprising:

a filter, a cap, and a valve body,

wherein said filter includes a valve hole and upper opening;

said cap has a convex portion, and a flange portion disposed around said convex portion;

an opening end of said upper opening of said filter has a bend portion;

an outer periphery end of said flange portion of said cap and said bend portion include a caulked portion that is caulked and jointed to each other;

said caulked portion is formed by caulking while said outer periphery end is positioned in said bend portion;

said valve body is disposed to cover said valve hole, in a space formed between said cap and said filter;

said cap and said filter are electrically connected to each other, by contact between said outer periphery end at said caulked portion and said bend portion;

said caulked portion includes an integral projection such that said outer periphery end and said bend portion are integrally projected;

said integral projection is formed by pressing a protuberant tool from above the bend portion, in a state that said outer periphery end is positioned in said bend portion; and

said integral projection has a stronger contact pressure as compared with zones other than said integral projection.

15. (Original) The top sealing plate of claim 14,

wherein said battery comprises a battery case, and a positive electrode, negative electrode, electrolyte, gasket and said top sealing plate disposed in said battery case; and

said battery case has a circular opening;

said top sealing plate is disposed at said opening of said battery case, in a state of being electrically insulated by said gasket so as to close said battery case; and

said filter is electrically connected to said positive electrode.

16. (Currently Amended) A battery, comprising:

a battery case, a positive electrode, a negative electrode, electrolyte, a gasket, and a top sealing plate,

wherein said positive electrode, said negative electrode, and said electrolyte are disposed in said battery case;

said battery case has an opening;

said top sealing plate is disposed at the opening of said battery case, in a state of being electrically insulated by said gasket so as to close said battery case;

said filter is electrically connected to said positive electrode;

said top sealing plate comprises a filter, cap, and valve body;

said filter has a valve hole and upper opening;

said cap has a convex portion, and a flange portion disposed around said convex portion;

an opening end of said upper opening of said filter has a bend portion;

an outer periphery end of said flange portion of said cap and said bend portion include a caulked portion that is caulked and joined to each other;

said caulked portion is formed by caulking while said outer periphery end is positioned in said bend portion;

said valve body is disposed to cover said valve hole, in a space formed between said cap and said filter;

said caulked portion includes ~~both states of contact of (i) a strong~~ a first contact portion and ~~(ii) a weak~~ a second contact portion, between the surface of the outer periphery end of said flange and said bend portion, a contact pressure of said

first contact portion is stronger than a contact pressure of said second contact portion; and

said outer periphery end of said flange portion includes a projection extending from at least one out of the surface and the back thereof;

said first contact portion is formed from a contact of said projection and said bend portion; and

said cap and said filter are electrically connected to each other, due to contact established between said outer periphery end and said bend portion at said caulked portion.

17. (Currently Amended) The battery of claim 16,

~~wherein said outer periphery end of said flange portion includes a projection extending from at least one out of the surface and the back thereof;~~

wherein said projection includes at least one selected from the group consisting of a plurality of small projections, bulges, and projected peripheral edge;

said strong contact portion is formed by said projection and said bend portion contacting with each other; and

said weak contact portion is formed by zones other than said projection and said bend portion contacting with each other.

18. (Currently Amended) The battery of claim 16,

said first contact portion is one of a plurality of first contact portions, said second contact portion is one of a plurality of second contact portions, and said caulked portion includes said first contact portions and said second contact portions; and

~~wherein each of said strong contact portion and weak contact portion includes a plurality of strong contact portions and a plurality of weak contact portions; and~~

~~the plurality of strong~~said first contact portions and ~~the plurality of said~~
second weak contact portions are disposed along the circumferential or radial
direction of said cap.

19. (Original) The battery of claim 17,

wherein the plurality of projections are disposed on the surface of said outer
periphery end of said flange positioned at the same side as said convex portion.

20. (Original) The battery of claim 17,

wherein said projection has vertically spring against the contact surface
between said flange portion and said bend portion.

21. (Original) The battery of claim 17,

wherein the distance from the mating face of said filter and cap to the peaks
of said plurality of projections is greater than the thickness of said flange portion;
and

each of said peaks has a stronger contact pressure against said bend portion
of said filter as compared with zones other than said peaks.

22. (Original) The battery of claim 17,

said caulked portion includes an integral projection such that said outer
periphery end and said bend portion are integrally projected;

said integral projection is formed by pressing a protuberant tool from above
the bend portion, in a state that said outer periphery end is positioned in said bend
portion; and

said integral projection has a stronger contact pressure as compared with
zones other than said integral projection.

23. (Currently Amended) A method of manufacturing a battery,
comprising the steps of:

(a) disposing a positive electrode, a negative electrode, and electrolyte in a battery case;

(b) manufacturing a top sealing plate;

(c) electrically connecting said filter and said positive electrode; and

(d) disposing said top sealing plate at the opening of said battery case via an electrical insulating gasket in order to close the opening,

wherein the step of manufacturing said top sealing plate comprises the steps of:

(1) forming a filter having a valve hole and upper opening;

(2) bending the opening end of the upper opening of said filter, to form a bend portion;

(3) forming a cap having a convex portion and a flange portion disposed around said convex portion;

(4) caulking to join the outer periphery end to said bend portion while the surface and back of the outer periphery end of said flange portion of said cap are positioned in said bend portion, to form a caulked portion; and

(5) disposing a valve body serving to cover the valve hole in a space formed between said cap and said filter, and

wherein the step of forming said cap includes forming a projection at said outer periphery end of said flange portion, said projection extending from at least one out of the surface and the back thereof; and

the step of forming said caulked portion includes a step of electrically connecting said cap and said filter to each other by contacting the outer periphery end at said caulked portion with said bend portion so that said caulked portion includes a first ~~both states of contact of (i) a strong~~ contact portion and ~~(ii) a weak~~ second contact portion, between the surface of the outer periphery end of said flange

and said bend portion, a contact pressure of said first contact portion is stronger than a contact pressure of said second contact portion.

24. (Currently Amended) The method of manufacturing a battery of claim 23,

~~wherein the step of forming said cap includes a step of forming a projection extending from at least one out of the surface and the back at the outer periphery end of said flange portion;~~

wherein said projection includes at least one selected from the group consisting of a plurality of small projections, bulges, and projected peripheral edge;

said strong contact portion is formed by said projection and said bend portion contacting with each other; and

said weak contact portion is formed by zones other than said projection and said bend portion contacting with each other.

25. (Currently Amended) The method of manufacturing a battery of claim 23,

~~wherein each of said strong-first contact portion is one of and weak contact portion includes a plurality of strong-first contact portions, and a plurality of weak~~
said second contact portions is one of a plurality of second contact portions, and said
caulked portion includes said first contact portions and said second contact portions;
and

~~the plurality of strong~~said first contact portions and ~~the plurality of weak~~said
second contact portions are disposed along the circumferential or radial direction of said cap.

26. (Original) The method of manufacturing a battery of claim 24,

wherein said projections are disposed on the surface of the outer periphery end of said flange positioned at the same side as said convex portion.

27. (Original) The method of manufacturing a battery of claim 24,

wherein said projection has vertically spring against the contact surface between said flange portion and said bend portion.

28. (Original) The method of manufacturing a battery of claim 24,

wherein the distance from the mating face of said filter and cap to the peak of said projection is greater than the thickness of said flange portion; and

each of said peaks has a stronger contact pressure against said bend portion of said filter as compared with zones other than said peaks.

29. (Original) The method of manufacturing a battery of claim 23,

wherein the step of forming said caulked portion includes a step of forming an integral projection at said outer periphery end and said bend portion, by pressing a protuberant tool from above the bend portion while the surface and back of said flange portion of said cap are positioned in said bend portion; and

said integral projection has a stronger contact pressure as compared with zones other than the integral projection.